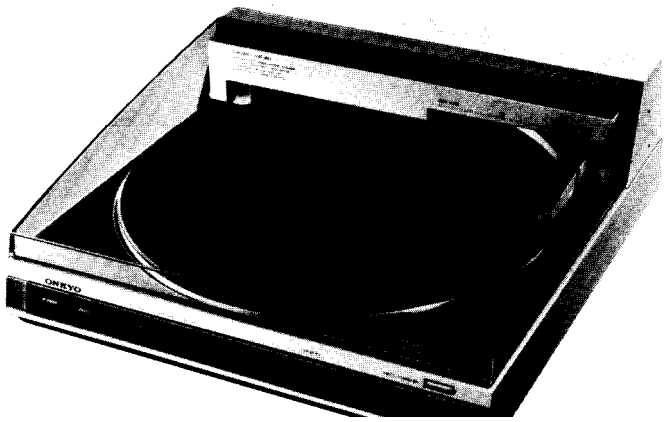
SERIAL NO. 3133

ONKYO® SERVICE MANUAL

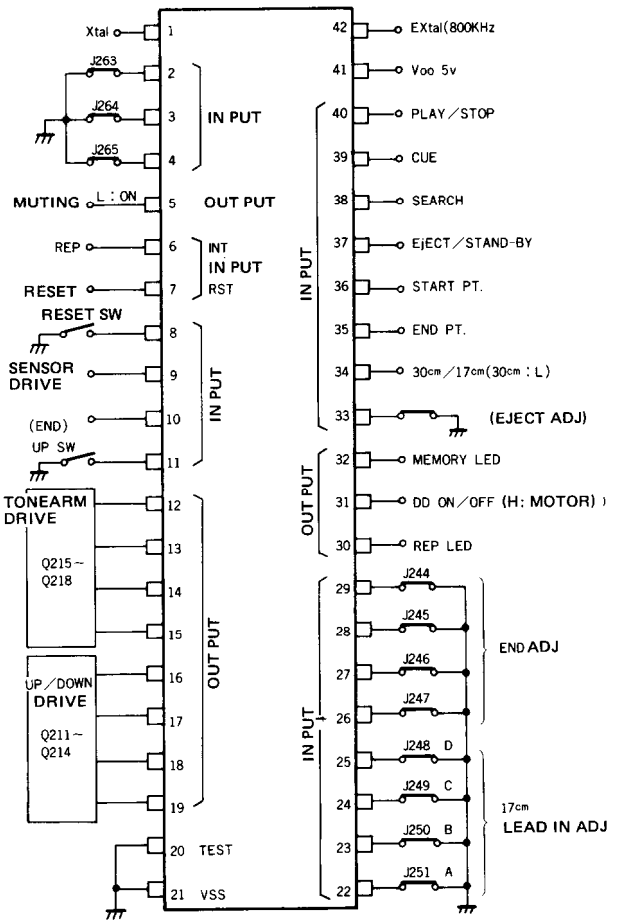
LINEAR TRACKING DIRECT DRIVE TURNTABLE MODEL PL-33



ONKYO® AUDIO COMPONENTS

MICROCOMPUTER OPERATION

Q201 LM6405H-070



Pin	Function
1	Connect the 800kHz oscillator Xtal.
2	Pins for electrical adjustment of stylus height; adjust stylus height when tonearm goes open to standby.
3	Open J263 to lower the stylus height 1.9mm.
4	Open J264 to lower stylus height 3.8mm. Open J23, 264 to lower the stylus height 5.7mm. Open J263 to lower the stylus height 7.5mm.
5	Pin for muting on/off; low is on, hight is off.
6	Pin for interruption of repeat operation.
7	Pin for reset; low for 80m sec when power is turned on.
8	Determines whether or not tonearm is above the stanolby position; low when arm is above the standby position.
9	Sensor input; low to operate the air drive motor, high to stop the arim drive motor.
10	Pin for the record end detection signal from the sensor; low causes the tonearm to return.
11	Determines whether or not the tonearm is open or standby.
12 13 14 15	Pins for the tonearm drive (horizontal movement) pulse motor
16 17 18 19	Pins for the tonearm drive (vertical movement) pulse motor

20	Test pin
21	Ground pin
22 23 24 25	Pin for adjustment of the 17cm lead-in position. See the adjustments section for details.
26 27 28 29	Determines the point of return when the tonearm is moved inward in the search mode or when the end is reached.
30	Lights the repeat LED.
31	Pin for direct-drive motor on/off and the play flip-flop clear direct-drive motor; low is stop and high is start.
32	Lights the memory LED.
33	Pin for adjustment of how far the dust opens; when J243 is open, the angle can be adjusted by about 5°
34	Determines whether the record is 30cm or 17cm.
35	Pin to memorize the end point; the number of pulses from the arm standby position is memorized.
36	Pin to memorize the start point as desribed in 35 above.
37	Pin for open/standby operation; hole down and open-standby switching will be repeated.
38	Pin for search operation; press once and the pulse motor moves the tonearm inward, press again and the pulse motor rotates in the opposite direction to move the tonearm outward.
39	Pin for cueing up/down operation.
40	Pin for play/stop operation. An operation pulse is generated after about 1.5 seconds when the tonearm is in the standby position. Stop is ordered the instant the arm moves from the standby position toward the record.
41	V_{DD} : supplies 5 volts

ADJUSTMENT PROCEDURES

1. Adjusting Stylus Height

1. Move the tonearm slightly with the search button (check for rest switch operation).
2. Stop the turntable with your hand.
3. Lower the tonearm by pressing the cueing button.
4. Turn the power off and raise the tonearm.
5. Adjust with a philips head screwdriver on counter-weight so that the stylus is 3.5 to 6mm above the T.T mat. (see mechanism diagram)
6. Turn the power on and press the open/stand-by switch to raise the tonearm and return it to the stand-by position.
7. Adjust J263, 264 and 265 so that the stylus is 3.5 to 6mm above the T.T mat.
   Cut J263 to lower the stylus 1.8mm.
   Cut J264 to lower the stylus 3.6mm.
   Cut J265 to lower the stylus 5.4mm.

2. Adjusting the Lead-in Position

* 30cm adjustment
Using an ES-1008 test record, adjust with a flat head screwdriver on the counterweight (see mechanism diagram) so there are 25 to 32 counts.

* 17cm adjustment
Using an ES-1008 test record, adjust J248, 249, 250 and 251 so there are 22 to 35 pulse counts. (Use a test record with the outer edge cut away or with small holes in it.)
Cut J251 to move the count 5 ~ 6 inward.
Cut J250 to move the count 11 ~ 12 inward.
Cut J248 to move the count 22 ~ 23 inward.
Cut J248 to move the count 44 ~ 45 inward.

3. Adjusting Sensor Sensitivity

1. Connect an oscilloscope to TP-A (Emitter of Q208).
2. In the stand-by position, move the stylus toward the center of the turntable platter (so the sensor holder is outside D601 and Q601) and adjust R208 so that 3 volts is produced.

4. Adjusting the Sensor Shutter

1. Connect an oscilloscope to TP-C (Collector of Q209).
2. In the stand-by position, adjust the sensor holder so that the sensor switches from high to low when the stylus is moved 3mm toward the center of the turn-table platter.

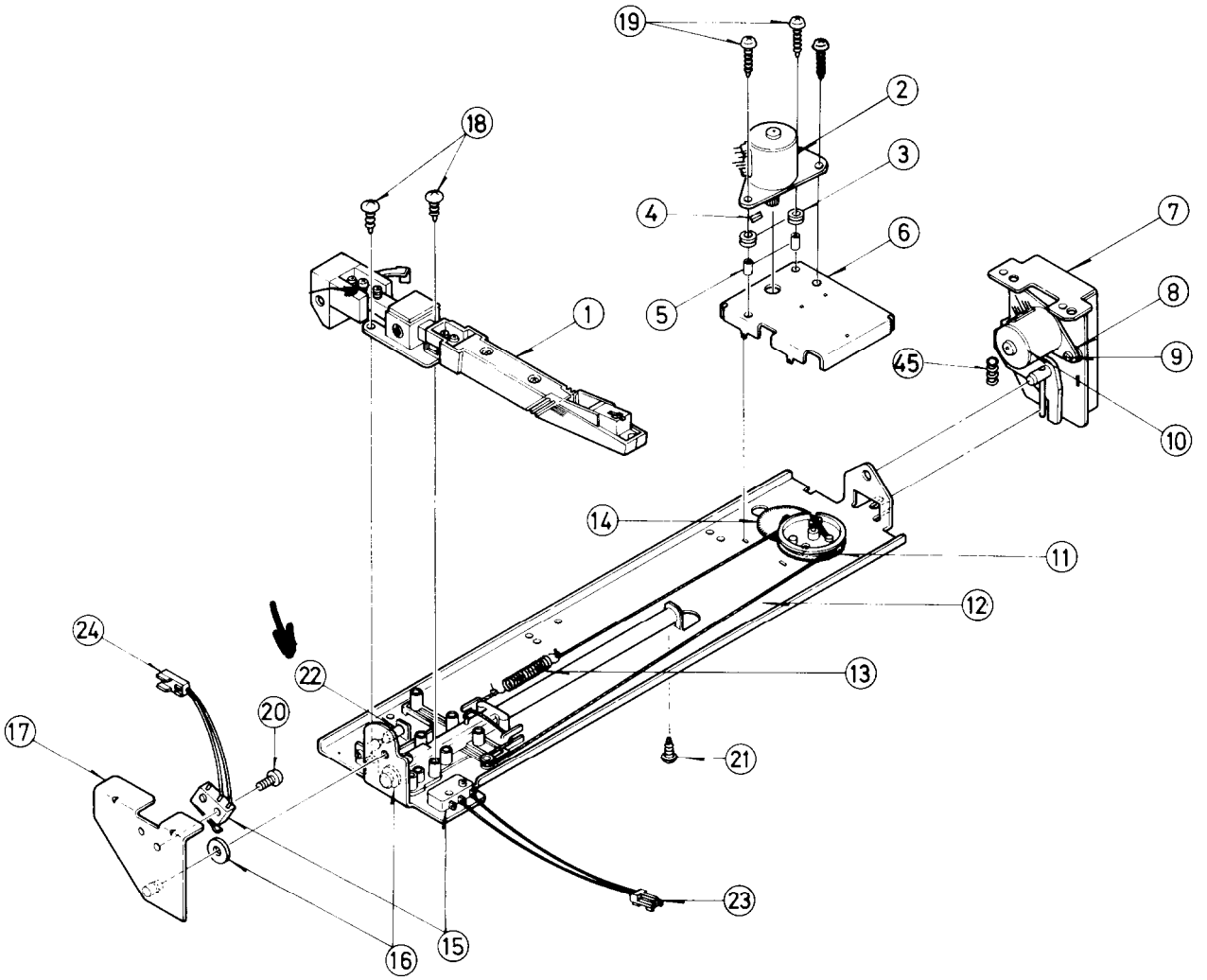
5. Adjusting the Return Position

1. Connect an oscilloscope to TP-B (Base of Q210).
2. In the stand-by position, adjust R211 so that the V_{BE} voltage is 0.6 to 0.7 when the stylus is moved toward the center of the turntable platter.
3. Checkpoints (use an ES-1008 test record):
   a) Set the speed selector to 33rpm.
   b) When trace the 1mm pitch of record, V_{BE} voltage is −0.05 to −0.08 in relation to the adjustment voltage (0.6 to 0.7 volts).
   c) Confirm that the tonearm returns within 7 counts at the 3mm pitch trace.
   d) Confirm that the tonearm returns more than 21 counts at the 1mm pitch trace.

6. Adjustment of Motor Speed (rpm)

Adjust the semi-fixed resistors VR_{33} and VR_{45} so that the motor speed is wihin ±0.15%.

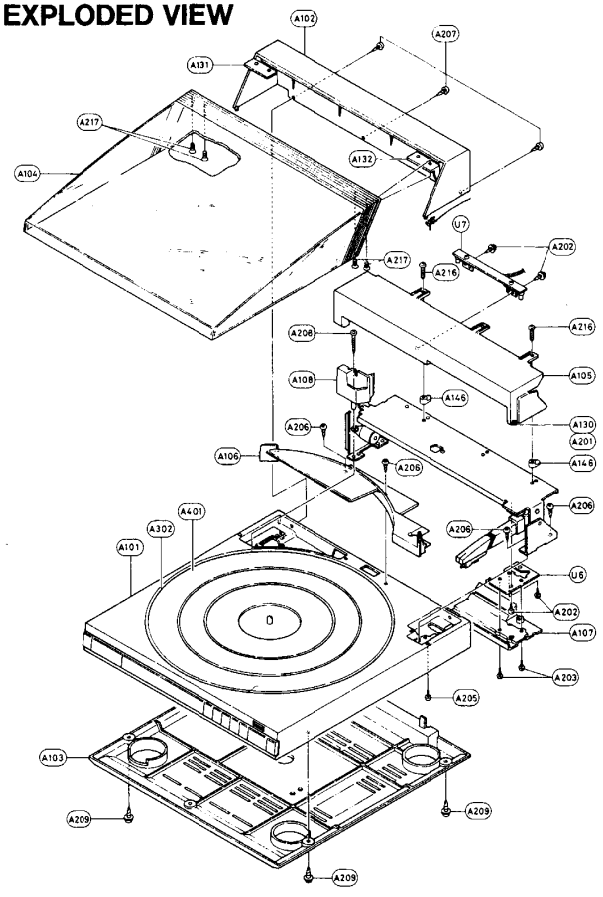
MECHANISM-EXPLODED VIEW



LINER MECHANISM-PARTS LIST

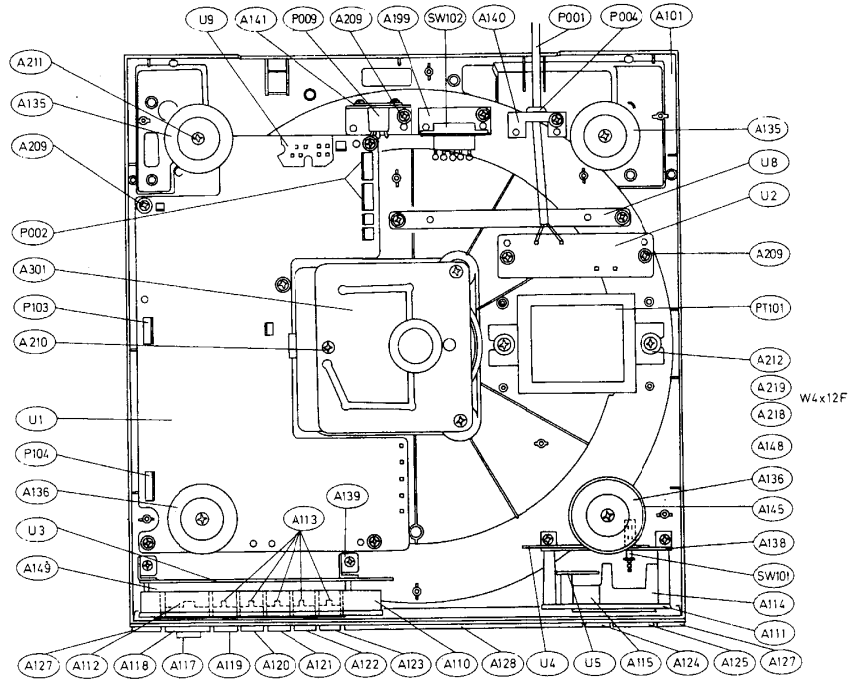
REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCTIPTION
	24506572A	Main mechanism ass'y	12	273903	Stringing
1	24501417	Tonearm ass'y	13	24503119	Spring
	242943	OC-56V, Cartridge	14	24503118	Gear
	242944	DN-56ST, Stylus	15	24503108	Microswitch
	24501411	Stylus cover	16	28140418-1	Cushion
2	24502147A	Motor ass'y	17	24506574	Side plate ass'y
3	24610125	Cushion	18	833130100	3TTP+10P screw
4	24509268	Cushion	19	82113008	3P+8FN, Pan head screw
5	24610124	Collar	20	82112308	2.3P+8FN, Pan head screw
6	24504330A	Case ass'y	21	82113006	3P+6FN, Pan head screw
7	24506573A	Gear box ass'y	22	24504329A	Adjusting screw
8	24509267	Cushion	23	2000203-1	Socket
9	82113005	3P+5FN, Pan head screw	24	2000204	Socket
10	24502146	Motor	45	24503120A	Spring
11	24506582	Reel			

EXPLODED VIEW



REF. NO.	PARTS NO.	DESCRIPTION
A101	28110238-1	Cabinet M
A102	28110239	Cabinet U
A103	27170124A	Bottom board (D/G/A)
	27170125	Bottom board (U)
A104	24509263A	Dust cover
A105	28184139A	Cover D, mechanism
A106	28184140	Cover C, mechanism
A107	28184141	Cover S, mechanism
A108	28184142	Cover L, mechanism
A110	27267174A	Guide R
A111	2726175B	Guide L
A112	27267176	Guide P
A113	27267177	Guide E
A114	27267196	Guide, power
A115	27267195	Guide S
A117	28320750	Knob, eject
A118	16621702	Knob, play
A119	16621703	Knob, cueing
A120	16621704	Knob, search
A121	16621705	Knob, repeat
A122	16621706	Knob, start
A123	16621707	Knob, end
A124	16621708	Knob, speed
A125	16621709	Knob, power
A127	28191122	Clear plate S
A128	28191123	Clear plate L
A130	27185011	Pulley
A131	27140647A	Rail L
A132	27140648A	Rail R
A133	28180071	Hinge, right
A134	28180072	Hinge, left
A135	24509264	Insulator
A136	24509232-1	Insulator
A138	27140638	Bracket, power
A139	27140682	Bracket S
A140	27140640	Bracket AC
	27140671	Bracket AC
A141	27140683	Bracket DIN
A143	27180122	Spring
A144	27180133	Spring
A145	27270088	Spacer (D)
	27270058	Spacer (G/U/A)
A146	27270085	Spacer D
A147	27270091	Spacer
A148	28140209	Cushion
A149	28140414	Cushion
A150	28140418-1	Cushion
A160	28140422	Cuchion
A161	28140432	Cushion
A199	27140684	Bracket U (U)
A201	833126060	2.6TTP+6P, Tapping screw
A202	833130080	3TTP+8P, Tapping screw
A203	833130100	3TTP+10P, Tapping screw
A204	831130100	3TTW+10P, Tapping screw
A205	834126068	2.6TTS+6B, Tapping screw
A206	834130088	3TTS+8B, Tapping screw
A207	834230088	3TTS+8B (Ni), Tapping screw
A208	834130208	3TTS+20B, Tapping screw
A209	831130088	3TTW+8B, Tapping screw
A210	834130088	4TTS+8B, Tapping screw
A211	834140128	4TTS+12B, Tapping screw
A212	834140168	4TTS+16B, Tapping screw
A213	834130068	3TTS+6B, Tapping screw
A214	82142004	2P+4FN (BC), Pan head screw
A215	82113006	3P+6F, Pan head screw
A217	82243005	3S+5FN (BC), Flat head screw
A218	801217	8W3P+12FN, Washer head screw
A219	87614012	W4x12F, Flat washer
A218	27265035	4x5x?.5mm, Ring
A219	893030S	E-3S, Retainig washer
A301	24502149	186V-4, Motor
A302	24502144	Turntable platter
A304	24506571A	Mechanism ass'y
A304-1	24506572A	Main mechanism ass'y
A304-1a	2000203-1	NSAS2P-107, Socket
A304-1b	28140418-1	Cushion
A304-2	24506573A	Gear box ass'y
A304-3	24506574	Side plate ass'y
A304-3a	2000204	NSAS2P-108, Socket
PT101	230625	NPT-771D, Power transformer
	230626	NPT-771G, Power transformer
	230627	NPT-771ADGQ, Power transformer (U)
	230628	NPT-771Q, Power transformer (A)
P001	253099A	AS-UC-3, POwer supply cable (D)
	253083	AS-CEE, Power supply cable (G/U)
	25077-1	POwer supply cable (A)

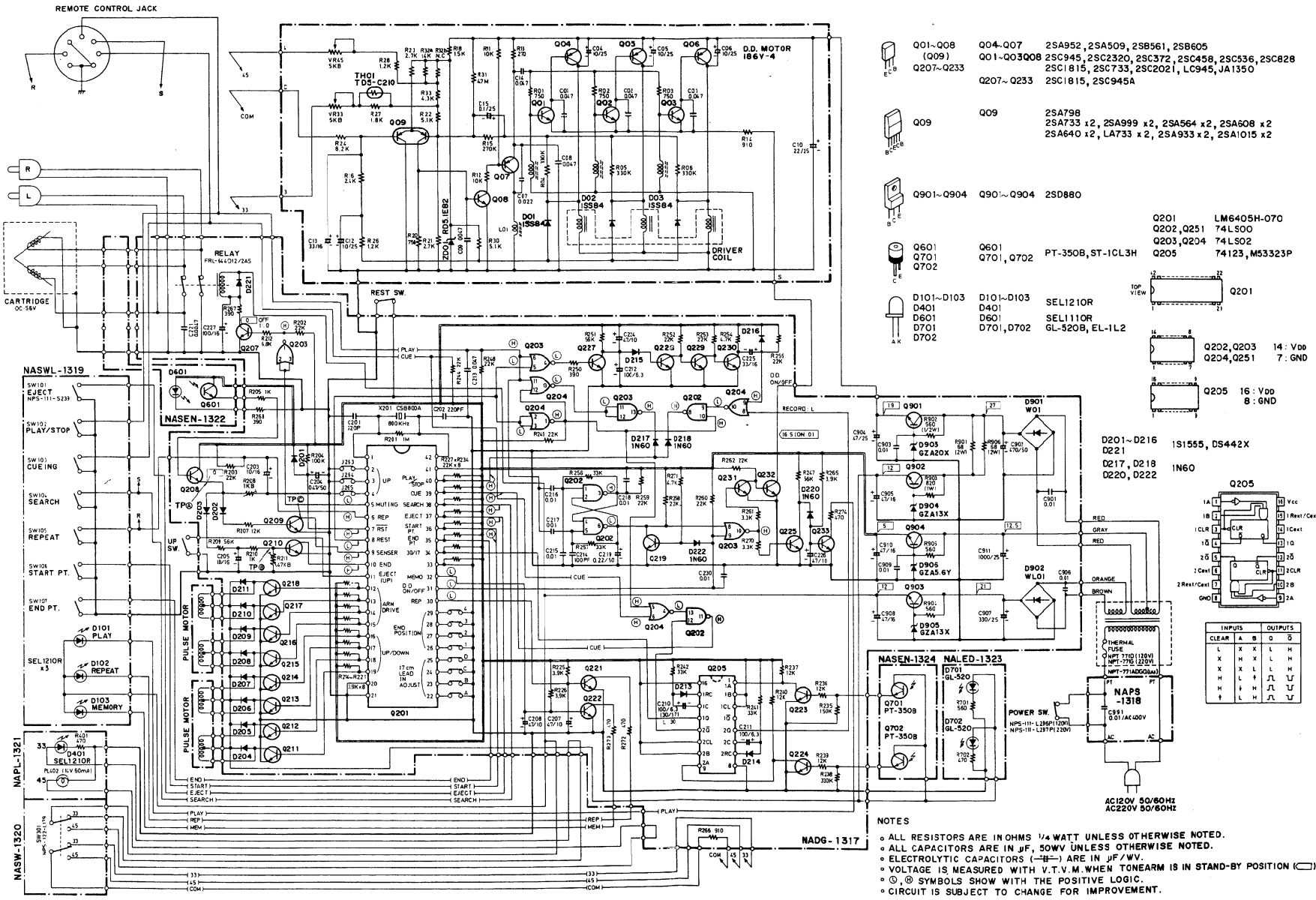
COMPONENT LOCATION



REF. NO.	PARTS NO.	DESCRIPTION
P002, P003	2000202	NSAS-6P103, Socket
P004	270025	SR-3P-4, Strainrelief (D)
	270280	SR-4K-4, Strainrelief (G/U)
	27300349	SR-6W-1, Strainrelief (A)
P008	260208	Binder
P009	25050045	NSCT-7P14, Socket, DIN
SW101	25035332	NPS-111-L296, Power switch (D)
	25035333	NPS-111-L297P, Power switch (G/U/A)
SW102	25065168-	HxW0131-01-060, Voltage selector switch (U)
U1	16558517A	NADG-1317a, Digital circuit pc board ass'y (D/G/U)
	16563517B	NADG-1317b, Digital circuit pc board ass'y (A)
U2	16558518A	NAPS-1318a, Power supply pc board ass'y
U3	16621519	NASWL-1319, Operation switch pc board ass'y
U4	16621520	NASW-1320, Speed selector switch pc board ass'y
U5	16621521	NAPL-1321, Speed indicator pc board ass'y
U6	16621522	NASEN-1322, End position detector pc board ass'y
U7	16621523	NALED-1323, Disk record detector pc board ass'y
U8	16621524	NASEN-1324, Disk record detector pc board ass'y

Note: D: 120V model
G: 220V model
U: Universal model
A: Australia model

SCHEMATIC DIAGRAM



Q01~Q08 (Q09) Q207~Q233	Q04~Q07	2SA952, 2SA509, 2SB561, 2SB605	
	Q01~Q03 Q08	2SC945, 2SC2320, 2SC372, 2SC458, 2SC536, 2SC828 2SC1815, 2SC733, 2SC2021, LC945, JA1350	
	Q207~Q233	2SC1815, 2SC945A	
Q09	Q09	2SA798 2SA733 x2, 2SA999 x2, 2SA564 x2, 2SA608 x2 2SA640 x2, LA733 x2, 2SA933 x2, 2SA1015 x2	
Q901~Q904	Q901~Q904	2SD880	
Q601 Q701 Q702	Q601 Q701, Q702	PT-350B, ST-1CL3H	
D101~D103 D401 D601 D701 D702	D101~D103 D401 D601 D701, D702	SEL1210R SEL1110R GL-520B, EL-1L2	

Q201: LM6405H-070
Q202, Q251: 74LS00
Q203, Q204: 74LS02
Q205: 74123, M53323P

Q201 (TOP VIEW)

Q202, Q203: 14 : VDD, 7 : GND
Q204, Q251

Q205: 16 : VDD, 8 : GND

D201~D216, D221: 1S1555, DS442X
D217, D218, D220, D222: 1N60

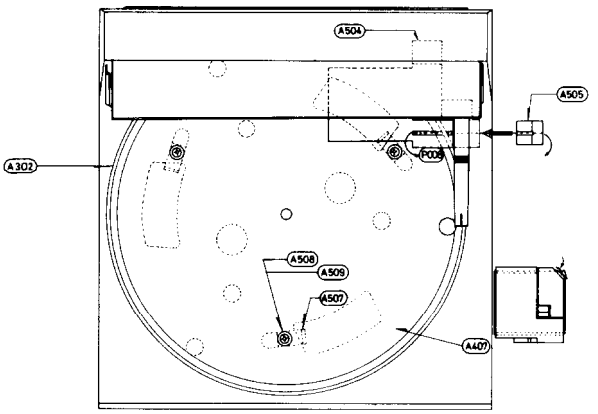
Q205

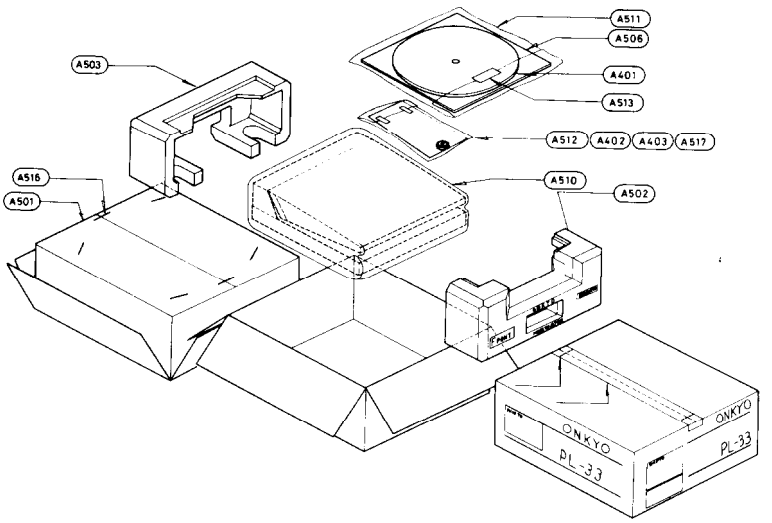
INPUTS			OUTPUTS	
CLEAR	A	B	Q	$\bar{Q}$
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↑	⎍	⎎
H	↓	H	⎍	⎎
H	L	H	⎍	⎎

NOTES

- ALL RESISTORS ARE IN OHMS 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊣|⊢) ARE IN μF/WV.
- VOLTAGE IS MEASURED WITH V.T.V.M. WHEN TONEARM IS IN STAND-BY POSITION (▭).
- Ⓛ Ⓗ SYMBOLS SHOW WITH THE POSITIVE LOGIC.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

PACKING VIEW





REF. NO.	PARTS NO.	DESCRIPTION
A501	29050573	Master carton box
A502	29090716	Pad F
A503	29090717	Pad B
A504	29090686-1	Pad PU
A505	29090694A	Pad S
A506	29090742	Pad sheet C
A507	27270084	Spacer
A508	834140168	4TTS+16B, Tapping screw
A509	87614012	W4x12F, Flat washer
A510	29100049	640x620mm, Poly-vinyl bag
A511	29100046	370x470mm, Poly-vinyl bag (Turntable platter)
A512	29100005A	220x330mm, Poly-vinyl bag (Accessary)
A516	282301	Sealing hook
A517	29365006-2	Wareanty card (D)
	29365005-3	Warranty card (G)
	290358002	Service station list (D)
A302	24502144	Tuntable platter

REF. NO.	PARTS NO.	DESCRIPTION
A401	24509265	T.T sheet
A402	292049A	45rpm adaptor
A403	29340625	Instruction manual (D)
	29340626	Instruction manual (G/U/A)
A404	29375059	DN56ST, Stylus label
A405	29360574	Rating label (D)
	29360575	Rating label (G)
	29360576	Rating label (U)
	29360586	Rating label (A)
A407	29355088	Sheet, paper
A409	29360577	Label
	29360578	Lavel U (W)
	25055018 or	CV-K-1 or
	25055040	CV-K-2, Conversion plug (U)
P008	260102	Twist wire

Note: D: 120V model
G: 220V model
U: universal model
A: Australia model

SPECIFICATIONS

Type:	Direct drive linear tracking turntable with two microcomputer controlled motors and fully automatic operation
Turntable Platter:	300 mm (12") aluminum die-cast
Motor:	Brushless DC direct drive
Speeds:	33-1/3, 45 rpm
Wow & Flutter:	0.027% (WRMS)
Signal-to-Noise Ratio:	72 dB (DIN B)
Tonearm:	Statically balanced, carbon fiber
Cartridge:	Dual magnet type, model OC-56V
Frequency Response:	20 – 25,000 Hz
Output Voltage:	3.5 mV (1 kHz)
Compliance:	8×10^{-6} cm/dyne
Tracking Force:	2.0 grams
Stylus:	0.6 mil. round diamond
Replacement Stylus:	DN-56ST
Power Supply:	220 V, 50 Hz, 120/220 V, 50/60 Hz
Dimensions (W x H x D):	330 x 126 x 338 mm (13" x 5" x 13-1/4")
Weight:	6.5 kg (14.4 lbs.)

* Specifications are subject to change due to further product improvements.

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